

THE INVENTION CLAIMED IS:

1. A method for manufacturing a liquid metal device, the method comprising:
solidifying liquid metal into solid metal balls;
collecting the solid metal balls adjacent an opening in the liquid metal device; and
5 liquefying the solid metal balls into liquid metal to flow into the opening.
2. The method of claim 1 wherein:
solidifying the liquid metal includes spraying the liquid metal in a liquid state into a
temperature-controlled chamber to form into the solid metal balls.
3. The method of claim 1 wherein:
10 solidifying the liquid metal includes collecting the liquid metal on a material that
assists in ball formation in a temperature-controlled chamber to form into the
solid metal balls.
4. The method of claim 1 wherein:
solidifying the liquid metal includes collecting the liquid metal on an array of material
15 or a material and a material feature that assists in ball formation in a
temperature-controlled chamber to form into the solid metal balls.
5. The method of claim 1 additionally comprising:
separating the solid metal balls into different size ranges; and
collecting the solid metal balls adjacent to the opening places solid metal balls of one
20 size range adjacent to the opening.
6. The method of claim 1 additionally comprising:
forming the liquid metal device to have a liquid metal dispensing reservoir adjacent
the opening to trap the solid metal balls adjacent to the opening.
7. The method of claim 1 additionally comprising:
25 agitating the solid metal balls to fill a liquid metal dispensing reservoir adjacent to the
opening.
8. A method for manufacturing a liquid metal switch device, the method
comprising:
solidifying liquid metal into solid metal balls;
30 separating the solid metal balls into different size ranges;

collecting the solid metal balls of one size range adjacent an opening in the liquid metal device; and

liquefying the solid metal balls into liquid metal to flow into the opening.

9. The method of claim 8 wherein:

5 solidifying the liquid metal includes spraying the liquid metal in a liquid state into a temperature-controlled chamber to form into the solid metal balls.

10. The method of claim 8 wherein:

10 solidifying the liquid metal includes collecting the liquid metal on a material or a material and a material feature that assists in ball formation in a temperature-controlled chamber to form into the solid metal balls.

11. The method of claim 8 wherein:

solidifying the liquid metal includes collecting the liquid metal on an array of a material that assists in ball formation in a temperature-controlled chamber to form into the solid metal balls.

12. The method of claim 8 wherein:

15 separating the solid metal balls uses screens, the screens each having different size openings.

13. The method of claim 8 additionally comprising:

20 forming the liquid metal device to have a liquid metal dispensing reservoir adjacent the opening to trap the solid metal balls of at least one of the different size ranges adjacent the opening.

14. The method of claim 8 additionally comprising:

agitating the solid metal balls to fill a liquid metal dispensing reservoir coupled to the opening;

25 melting the solid metal balls;

using a wetting agent, a surfactant, or differential pressure, to fill a main chamber in the liquid metal device through the opening; and

sealing the liquid metal dispensing reservoir with liquid metal in the main chamber.

15. A liquid metal switch device manufacturing system comprising:

30 temperature-controlled equipment for solidifying liquid metal into solid metal balls;

screening equipment for separating the solid metal balls into different size ranges; and

a separator for collecting the solid metal balls of one size range adjacent an opening provided in the liquid metal device.

16. The system of claim 15 wherein:

the temperature-controlled equipment comprises a cooling chamber and a spray nozzle for spraying the liquid metal in a liquid state into the temperature-controlled chamber to form into the solid metal balls.

17. The system of claim 15 wherein:

the temperature-controlled equipment comprises:

a tray having an array of a material or a material and a tray feature that assists in ball formation of liquid metal; and

a temperature-controlled chamber to cool liquid metal placed onto the array into the solid metal balls.

18. The system of claim 15 wherein:

the separator comprises stacked screens, each screen having smaller size openings than the screen above.

19. The system of claim 15 wherein:

the liquid metal device has a liquid metal dispensing reservoir adjacent the opening to trap the solid metal balls of at least one of the different size ranges adjacent the opening.

20. The system of claim 15 additionally comprising:

an agitator for agitating the solid metal balls and the liquid metal switch device to fill a liquid metal dispensing reservoir provided therein;

means for melting the solid metal balls to fill a main chamber in the liquid metal device has the opening; and

a seal for sealing the liquid metal dispensing reservoir and the liquid metal in the main chamber.